

Recommended pass through the study plan

Name of the pass: Specialization Mobile Communications - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering

Department:

Pass through the study plan: Electronics and Communications - Mobile Communications

Branch of study guaranteed by the department: Welcome page

Guarantor of the study branch:

Program of study: Electronics and Communications

Type of study: Follow-up master full-time

Note on the pass:

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-----------------|----------|------|
| BEZM | Safety in Electrical Engineering for a master's degree Vladimír K la, Radek Havlí ek, Ivana Nová, Josef ernohous, Pavel Mlejnek Radek Havlí ek Vladimír K la (Gar.) | Z | 0 | 2BP+2BC | Z | P |
| B2M37DKM | Digital communications Jan Sýkora Jan Sýkora Jan Sýkora (Gar.) | Z,ZK | 6 | 3P+1C | Z | P |
| B2M37MAM | Microprocessors Petr Skalický, Stanislav Vítek Stanislav Vítek Stanislav Vítek (Gar.) | Z,ZK | 6 | 2P+2L | Z | P |
| B2M32MKSA | Mobile Networks Zden k Be vá , Robert Beš ák, Pavel Mach Pavel Mach Zden k Be vá (Gar.) | Z,ZK | 6 | 2P + 2L | Z | P |
| B2M31DSP | Advanced DSP methods Pavel Sovka, Petr Pollák Pavel Sovka Pavel Sovka (Gar.) | Z,ZK | 6 | 2P+2C | Z,L | P |
| B2M32PST | Advanced Networking Technologies Zbyn k Kocur, Leoš Bohá Leoš Bohá Leoš Bohá (Gar.) | Z,ZK | 6 | 2P + 2C + 4D | Z | P |

Number of semester: 2

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------|---------|----------|------|
| B2M17ANT | Antennas Pavel Hazdra, Miloš Mazánek, Jan Kra ek Jan Kra ek Pavel Hazdra (Gar.) | Z,ZK | 6 | 2P+2L | L | P |
| B2M32BTSA | Wireless Technologies Zden k Be vá , Pavel Mach, Zbyn k Kocur, Lukáš Vojt ch Ján Ku erák Zden k Be vá (Gar.) | Z,ZK | 6 | 2P + 2L | L | P |
| B2M17SBS | Wave Propagation for Wireless Links Pavel Pecha Pavel Pecha Pavel Pecha (Gar.) | Z,ZK | 6 | 2P+2C | L | P |
| 2018_MEKPV6 | Povinn volitelné p edm ty programu B2M37ART,B2M32DMT,..... (see the list of groups below) | Min. cours. 5 Max. cours. 5 | Min/Max 30/30 | | | PV |

Number of semester: 3

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| B2MPROJ6 | Project Ivan Pravda, Tomáš Zeman, Ji í Jakovenko, Pavel Máša, František Rund, Jan Šístek, Lubor Jirásek, Ladislav Oppl František Rund František Rund (Gar.) | Z | 6 | 0p+6s | Z,L | P |

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|-------------|------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------|--|--|----|
| 2018_MEKPV6 | Povinn voliteľné p edm ty programu <i>B2M37ART,B2M32DMT,..... (see the list of groups below)</i> | Min. cours. 5 Max. cours. 5 | Min/Max 30/30 | | | PV |
| 2018_MEKVOL | Voliteľné odborné p edm ty2018 | Min. cours. 0 | Min/Max 0/999 | | | V |

Number of semester: 4

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|-------|----------|------|
| BDIP25 | Diploma Thesis | Z | 25 | 22s | L | P |
| 2018_MEKVOL | Voliteľné odborné p edm ty2018 | Min. cours. 0 | Min/Max 0/999 | | | V |

List of groups of courses of this pass with the complete content of members of individual groups

| Kód | Name of the group of courses and codes of members of this group (for specification see here or below the list of courses) | Completion | Credits | Scope | Semester | Role |
|--------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|-----------|--------------------------------------|------|
| 2018_MEKPV6 | Povinn voliteľné p edm ty programu | Min. cours. 5 Max. cours. 5 | Min/Max 30/30 | | | PV |
| B2M37ART | Architecture of radio receivers ... | B2M32DMT | Diagnostics and Measurement in T ... | B2M32DZSA | Digital Signal Processing in Tel ... | |
| B2M32DSVA | Distributed Computing | B2M32IBEA | Information Security | B2M37KDKA | Coding in digital communications | |
| B2M32PRSA | Access Networks | B2M32RTK | Telephony Communication Control | B2M32THOA | Queueing Theory | |
| 2018_MEKVOL | Voliteľné odborné p edm ty2018 | Min. cours. 0 | Min/Max 0/999 | | | V |

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|
| B2M17ANT | Antennas Student will get strong knowledge about theory of electromagnetic field radiation and basic principles of antenna design. Methods of analysis are demonstrated on various types of antennas and their arrays. Seminars are both theoretical (analytical and numerical calculation using MATLAB and EM simulators CST) and practical (measurement of antenna parameters). | Z,ZK | 6 |
| B2M17SBS | Wave Propagation for Wireless Links The aim of the course is to study the wireless transmission channel in real environments focusing on wave propagation for planning of terrestrial and satellite wireless links. The syllabus includes both deeper theoretical foundations of radio wave propagation in the atmosphere as well as ITU-R design procedures for terrestrial and satellite, fixed and mobile communications in various frequency bands. | Z,ZK | 6 |
| B2M31DSP | Advanced DSP methods The course follows the basic course in signal processing and introduces advanced methods of analysis and digital signal processing. Graduates will learn the methods of digital signals analysis and be able to practically use them. They learn to know the conditions of use of correlation, spectral and coherent analysis of random signals. They will become familiar with methods of signal decomposition and independent component analysis and the time-frequency transformations. Emphasis will be placed on an ability to interpret the results of signal analyses. | Z,ZK | 6 |
| B2M32BTSA | Wireless Technologies The lectures give overview of fundamental principles of wireless networks in various areas of their application. Students will understand architecture, principles and protocols used in different wireless technologies and learn how these technologies can be exploited in real world applications. The goal is to teach students how to solve problems related to deployment of wireless networks, their operation or development of wireless networks components. | Z,ZK | 6 |
| B2M32DMT | Diagnostics and Measurement in Telecommunications The subject builds on knowledge of basic types of interfaces used in telecommunications (from classic, via a packet-oriented and expected future generation system). Explains the importance of key parameters, presents tools for the monitoring and measurement methodology and fault diagnosis. Students verify acquired knowledge to practical tasks in the laboratory to real systems and advanced measurement techniques. | Z,ZK | 6 |

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------|----|
| B2M32DSVA | Distributed Computing | Z,ZK | 6 |
| The course is focused on technologies that support distributed computing: on mechanisms ensuring reliable, efficient and secure connection of application processes, programming interfaces of communication channels and up-to-date middleware technologies. A significant part of lectures is dedicated to distributed algorithms that assure causality, exclusive access, deadlock detection/avoidance, fault-tolerance, mobile computing, and security. | | | |
| B2M32DZSA | Digital Signal Processing in Telecommunication | Z,ZK | 6 |
| The goal of the subject is to make familiar with theory, methods and implementation of algorithms of the digital signal processing of one- and multi-dimensional signals related to the telecommunication technology. | | | |
| B2M32IBEA | Information Security | Z,ZK | 6 |
| The Information Security course provides a complete source of information on the field of security of information systems and information technologies. The most of information in today society is created, transferred, stored in electronic form so information security is very important part of it. Technical background for information security is provided by cryptology. | | | |
| B2M32MKSA | Mobile Networks | Z,ZK | 6 |
| The lectures introduce principles and functionalities of mobile networks with special focus on currently deployed technologies and future mobile networks. Furthermore, architecture and fundamental principles of GSM, UMTS, LTE/LTE-A, and 5G will be explained. Then, selected key technologies for future mobile networks (6G) will be explained. | | | |
| B2M32PRSA | Access Networks | Z,ZK | 6 |
| The course covers the area of high-speed transmission of information in the access network level, with emphasis on the use of optical transmission media and its combination with metallic lines (FTTx). In the practical part, students will learn the methods required for the design, modeling, measurement and analysis of transmission media, diagnostics of systems and whole access networks. | | | |
| B2M32PST | Advanced Networking Technologies | Z,ZK | 6 |
| Subject Advanced Network Technologies expands students' knowledge of modern network technologies. The course is practically oriented and focused on explaining the function of advanced network protocols as used in modern data networks of today and tomorrow. Students will gain practical experience with the issues like Internet routing, software-defined networks, multicast routing, IPv6, and MPLS networks. Part of the course is also devoted to a detailed explanation of transport protocols TCP/UDP and a manner in which software applications can access transportation services of TCP/IP data networks. | | | |
| B2M32RTK | Telephony Communication Control | Z,ZK | 6 |
| The course is oriented to audio or video issues in telecommunication networks, both fixed and mobile. Students will learn principles of switching systems and their management as well as the course will provide them with an overview of signaling systems in central exchanges and networks. The focus is on digital switching systems as circuit as packet switch oriented, i.e. so-called next generation network (NGN) and voice communication in 4G networks. (VoLTE). | | | |
| B2M32THOA | Queueing Theory | Z,ZK | 6 |
| The aim of the course is to present an overview of dimensioning of telecommunication networks on the basis of results of the queueing theory (QT) and to introduce possibilities of simulation and modelling of networks, both from the point of view of grade of service (GoS) and quality of service (QoS). Results of the QT are applied on different service systems and telecommunication networks being currently operated and developed. Theoretical knowledge about models of service systems can be applied on dimensioning of different service systems in real life - not only on the telecommunications one. | | | |
| B2M37ART | Architecture of radio receivers and transmitters | Z,ZK | 6 |
| The subject deals with the architecture of the radio receivers and transmitters and software radio. The student s familiarize with the design and the modern methods of optimization of the radio receivers and transmitters' functional blocks and with the phenomena related with frequency conversion, noise sources and noise analyses. They learn conceptual radio receiver and transmitter design, including the level and frequency plans and their optimization. The course also deals with the digital signal processing blocks of the modern radio receivers and their practical implementation. | | | |
| B2M37DKM | Digital communications | Z,ZK | 6 |
| The course provides fundamentals of digital communications theory: modulation, classical coding, channel models, and basic principles of decoding. The exposition is systematically built along the theoretical lines which allow to reveal all inner connections and principles. This allows students to develop the knowledge and use it in an active way in a design and construction of the communication systems. The course provides a necessary fundamental background for subsequent more advanced communications theory courses. | | | |
| B2M37KDKA | Coding in digital communications | Z,ZK | 6 |
| This course extends and deepens the topics of the basic communication theory courses in the following main areas. 1) Advanced information theory in coding and Network Information Theory develop a framework for understanding the principles of the channel coding in single-user and multi-node/multi-user scenarios. 2) The algebraic coding presents classical topics of block and convolutional codes. 3) Advanced coding technique focuses on turbo, LDPC, Space-Time codes and Wireless Network Coding. 4) Advanced decoding technique, namely iterative and multi-user decoding is a fundamental tool for decoding capacity approaching channel codes. | | | |
| B2M37MAM | Microprocessors | Z,ZK | 6 |
| The aim is to make students acquainted with the properties of microprocessor systems, make students familiar with on-chip peripherals, connect external circuit to the processor bus, and with implementation of the memory or I/O space address extension. Next, taught the students to make simple program in the assembly language, C language and combination of both. After completion of this subject student should be able to design and implement simpler microprocessor system including connection of necessary peripherals and software design. | | | |
| B2MPROJ6 | Project | Z | 6 |
| Independent work in the form of a project. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The project will be defended within the framework of a subject. Project list http://www.fel.cvut.cz/en/education/semestral-projects.html | | | |
| BDIP25 | Diploma Thesis | Z | 25 |
| Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination. | | | |
| BEZM | Safety in Electrical Engineering for a master's degree | Z | 0 |
| The course provides for students of all programs periodic training guidelines for health and occupational safety and gives knowledge of electrical hazard of given branch of study. Students receive indispensable qualification according to the current Directive of the Dean. | | | |

For updated information see <http://bilakniha.cvut.cz/en/f3.html>

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